

RECORDS OF PROCEEDINGS AT MEETINGS

ANNUAL GENERAL MEETING

held on *Friday 21 November 1997* at the Scientific Societies' Lecture Theatre, New Burlington Place, Professor J. M. BALL, FRS, President, in the Chair. There were present about 60 members and visitors.

Dr A. R. Pears and Dr D. J. Collins were appointed Scrutineers for the election of Council Members and collected the ballot papers. The Treasurer, Professor A. O. Morris, presented his annual report, which will be published in the *Newsletter*. Messrs Fraser Russell were appointed as auditors.

Twenty-one people were elected to Ordinary Membership: A. Aalam, J. Berndt, D. Crisan, D. R. Fearn, A. Fleet, A. Fokas, L. Fradkin, K. D. Glazebrook, G. Jin, C. W. H. Mace, M. Malutshi, J. Martin, P. A. Minh, A. C. Newell, M. K. Pidcock, D. Porter, M. W. Rees, D. S. Riley, I. Roulstone, D. Simpson, T. E. Stinchcombe; six were elected to Associate Membership: A. R. Auld, P. A. Hammond, F. Mirza, J. K. Nath, S. L. Ng, S. Sezgin; and two were elected to Reciprocity Membership: J. D. L. Caro (South East Asian Math. Soc.), P. Kirschenhofer (Amer. Math. Soc.). Two members signed the book and were admitted to the Society.

Dr M. R. Jerrum gave a lecture entitled 'Coupling techniques in the design and analysis of experiments'.

After tea, the Scrutineers announced the election results. The following Officers and Members of Council were elected: President: Professor J. M. Ball, FRS; Vice-Presidents: Professor K. A. Brown, FRSE, Professor A. J. Macintyre, FRS; Treasurer: Professor A. O. Morris; Council and General Secretary: Professor J. S. Pym; Meetings and Membership Secretary: Dr D. J. H. Garling; Publications Secretary: Professor E. C. Lance; Librarian: Dr J. A. Erdos; Members-at-Large (two-year terms): Dr C. A. Hobbs, Professor M. A. H. MacCallum, Dr I. A. Stewart; Members-at-Large (one-year terms): Professor U. Martin, Professor P. T. Saunders, Professor M. J. Taylor, FRS. Council Membership is completed by the following who were elected for two-year terms in 1996: Professor R. J. Archbold, Dr A. G. Chetwynd, Professor F. C. Kirwan, Professor E. G. Rees, FRSE, Professor A. J. Scholl, Professor J. F. Toland.

The President, on Council's behalf, presented the 1997 Naylor Prize Certificate to Professor F. P. Kelly, FRS, who then gave the 1997 Naylor Prize Lecture on 'Pricing and rate control for communication networks'.

The meeting adjourned for the Annual Dinner, which was held at the Naval and Military Club and attended by 61 people.

Citation for Frank Patrick Kelly

Professor F. P. Kelly of the University of Cambridge is awarded the 1997 Naylor Prize for his many contributions to the mathematical theory of networks and

communications. While keeping applications to the forefront of his research, he has supported this by producing elegant mathematical proofs, accompanied by lucid and attractive exposition of his work.

His 1979 book *Reversibility and stochastic networks* brought him instant international recognition. It drew together many apparently isolated results concerning queueing networks, operational research models and genetic models. The work was shot through with insight and led immediately to powerful generalisations, prompting a whole new wave of development.

Professor Kelly followed this work through in the highly topical area of telecommunication systems, collaborating with British Telecom. His freshness of view brought quick results and again set him amongst the very best in this international field. He developed the study of large networks and the optimisation of routing and acceptance rules for such networks. The aim is to produce operating rules which are simple, demand only locally available information, allow rapid adaptation to rapidly changing situations, and yet give performance near the optimal possible. It needs a keen and insightful mind to realise that these apparently conflicting demands can be reconciled; that it is indeed possible is demonstrated by Professor Kelly's development of 'dynamic alternative routing' (now implemented in British Telecom's UK national network). Since then he has developed analogous techniques for the real-time allocation of frequencies for cellular phone systems and the real-time allocation of network capacity to the many different types of traffic (for example, audio, video, computer) now in existence.

The telecommunications application led Professor Kelly to the issues which are common to most large, complex systems: of design as well as operation, of the optimal extension of design, of the need for judicious decentralisation, of the occurrence of critical transitions and 'changes of state', of the economic subtleties and game-theoretic paradoxes (all mathematical in essence) of systems for which the ultimate consequences of almost any action run counter to naive intuition.

Professor Kelly continues to demonstrate his capacity to translate formidable practical problems into equally formidable mathematical equivalents, which nevertheless yield to his extraordinary insight.